WASHINGTON DEPARTMENT OF ECOLOGY

ENVIRONMENTAL ASSESSMENT PROGRAM

FRESHWATER MONITORING UNIT

STREAM DISCHARGE TECHNICAL NOTES

STATION ID: 45F070

STATION NAME: Peshastin Creek at Green Bridge Road

WATER YEAR: 2013

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Introduction

Watershed Description

Peshastin Creek originates in the snowfields of the eastern slopes of the central Cascade Mountain range and flows into the Wenatchee River at river mile 17. The watershed is bounded by both the Stuart Range (Mount Stuart: 9,415 ft) and the Wenatchee Mountains. Land cover above the gage consists of predominantly coniferous forest, but also includes alpine shrubland, montane grassland, bedrock/talus slopes, and riparian woodlands. A large portion of the lower watershed is used for agricultural production (tree fruit). Mean annual precipitation across the watershed above this gage location is 36 inches (U.S. Weather Bureau, 1965).

Gage Location

The telemetered stream gaging station on Peshastin Creek at Green Bridge Road was installed on September 20, 2002. The gage is located at the Green Bridge Road bridge on the right bank, approximately 1.4 miles upstream of the mouth.

Table 1. Basin Area and Legal Description

Drainage Area (square miles)	134 (USGS, 2013)
Latitude (degrees, minutes, seconds)	47°33’09” N
Longitude (degrees, minutes, seconds)	120°36’13” W

Table 2. Discharge Statistics.

Mean Annual Discharge (cfs)	171
Median Annual Discharge (cfs)	108
Maximum Daily Mean Discharge (cfs)	944
Minimum Daily Mean Discharge (cfs)	11
Maximum Instantaneous Discharge (cfs)	1120
Minimum Instantaneous Discharge (cfs)	7.1
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	392
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	24
Number of Days Discharge is Greater Than Range of Ratings	0
Number of Days Discharge is Less Than Range of Ratings	0
Number of Un-Reported Days	16
Number of Days Qualified as Estimates	34
Number of Modeled Days	0

Note: Statistics displayed in Table 2 may not include values in which the predicted discharge exceeds the range of ratings.

Table 2 Discussion (Discharge Statistics)

Seven discharge measurements were conducted at this site in Water Year 2013, ranging from 463 cfs on May 15 to 21 cfs on August 27. The station was mostly ice-free over the winter months, except for a 16-day period in December. Peak flows were related to runoff from snowmelt beginning in March and reaching their maximum values in May. Minimum discharges were observed during baseflow conditions. Some instability in the stage record was observed during the baseflow period that was related to irrigation returns upstream of the gaging station.

Unreported days were due to ice in the channel which made the stage-discharge relationship invalid. Thirty-three of the days qualified as estimates were due to logger drift exceeding 20% of the reported discharge and had a difference in the reported discharge greater than 0.50 cfs. One day qualified as estimated had a six-hour gap in the stage data that was filled using linear interpolation.

Table 3. Error Analysis Summary.

Potential Logger Drift Error (% of discharge)	7.3%
Potential Weighted Rating Error (% of discharge)	15.3%
Total Potential Error (% of discharge)	22.6%

Table 3 Discussion (Error Analysis)

The majority of the uncertainty in discharge record for WY 2013 is due to potential rating error. Most of this uncertainty can be attributed to difficult measuring conditions. Boulders are present either in or immediately upstream of every available measuring section, resulting in turbulence, split flows, and unusual velocity profiles which reduce the overall certainty of the measurment.

Table 4. Stage Record Summary

Minimum Recorded Stage (feet)	0.59
Maximum Recorded Stage (feet)	3.34
Range of Recorded Stage (feet)	2.75

Table 4 Discussion (Stage Record)

Stage in WY2013 peaked on May 15th and was at its lowest on August 27th.

Table 5. Rating Table Summary

Rating Table No.	603		
Period of Ratings	10/01/2012-9/30/2013		
Range of Ratings (cfs)	3.75-5880		
No. of Defining Measurements	50		
Rating Error (%)	15.3		

Rating Table No.			
Period of Ratings			
Range of Ratings (cfs)			
No. of Defining Measurements			
Rating Error (%)			

Rating Table No.			
Period of Ratings			
Range of Ratings (cfs)			
No. of Defining Measurements			
Rating Error (%)			

Table 5 Discussion (Rating Tables)

Table #603 was valid for all of Water Year 2013. Table #603 is a duplicate of Table #6, which has historically represented the stage-discharge relationship under stable channel conditions at this site.

Table 6. Model Summary

Model Type (Slope conveyance, other, none)	Slope-Conveyance
Range of Modeled Stage (feet)	3.64 to 6.73
Range of Modeled Discharge (cfs)	1440 cfs to 5880 cfs
Valid Period for Model	11/22/2006 to NOW
Model Confidence	+/- 1.25%

Table 6 Discussion (Modeled Data)

Flows during this water year were below the modeled range.

Table 7. Survey Type and Date (station, cross section, longitudinal)

Type	Date
N/A	N/A

Table 7 Discussion (Surveys)

No surveys were conducted in WY 2013.

Activities Completed

No activities outside of routine station visits and measurements were conducted in WY 2013.

Appendix